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Political Opportunism and Countercyclical Fiscal Policy in Election-year Recessions

FRANK BOHN* **and FRANCISCO JOSÉ VEIGA†**

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Political budget cycles (PBCs) have been well documented in the literature, albeit not for all circumstances. However, no work has been done on the impact of economic growth on the magnitude of PBCs. The theoretical model argues that a government has an incentive to increase fiscal manipulations when a recession is expected to hit and curtail re-election chances; this amounts to countercyclical policy for opportunistic rather than Keynesian motives. Very robust evidence for this behaviour is found in Portuguese municipalities; in election years, budget deficits go up even more and significantly so, when a recession is expected.

JEL classification: D72, E62, H62

Keywords: political budget cycles; Keynesian countercyclical policies; political opportunism; local governments; Portugal.

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1 Introduction

It has been accepted as a stylized fact that political budget cycles are context-conditional[1], i.e. do not happen under all circumstances, but, for instance, in countries with fiscal or government intransparencies or lack of media freedom (Alt and Lassen, 2006; Akhmedov and Zhuravskaya, 2004; and Veiga, Veiga and Morozumi, 2017, respectively), in developing countries (Schuknecht, 1996 and 2000; Block, 2002; Shi and Svensson, 2006; and Vergne, 2009), or in new democracies (Brender and Drazen, 2005), and are affected by the political system (Chang, 2008, and Streb, Lema and Torrens, 2009) and/or the electoral system (Aidt and Mooney, 2014). What has not been studied is the question of how opportunistic governments respond to the regular business cycle, i.e. to (expected) changes in economic growth. Brender and Drazen (2008) find that low growth affects re-election chances at least in less developed countries and new democracies. Intuitively, one would think that an (expected) recession prompts the government to counteract or, at least, to limit the reduced re-election probability by increasing its fiscal manipulation (see also Bohn, 2016).

This paper captures this idea in an analytical model which makes use of earlier models, but with significant modifications. It uses the insight of Rogoff (1990) and Rogoff and Sibert (1988) that voters want to vote for the politician with the higher expected competence in the future. As suggested by Lohmann (1998) voters are uninformed about the incumbent's competence which incumbents, too, can only judge once a new task has been tackled more or less successfully. Shi and Svensson (2006) use the same setting, but apply it to fiscal policy, in particular to the government's choice of the deficit level. The model in this paper extends their framework to allow for economic growth and inertia in voter perceptions of economic growth. It can be shown that the government's realistic

[1] The term was coined by Franzese (2002). A literature survey is provided by de Haan and Klomp (2013a).

forecast for a recession[2] prompts the government to expand its manipulation in election years, i.e. produce countercyclical policy caused by opportunism rather than Keynesian motives.[3] Countercyclical policy is also present when the government expects a boom.

The main finding of the theoretical model is supported by evidence from Portuguese municipalities. The empirical section shows that there is indeed a countercyclical policy effect when realistic forecasts predict negative growth or unusually low growth (below certain percentiles) in election years. The result is also robust to including or not a series of control variables, controlling for time specific effects in several alternative ways, and to restricting the sample to the 278 municipalities of mainland Portugal instead of using all 308.

The theoretical analysis incorporates the idea that voters' perception of economic developments lags behind. The main countercyclicality result would only vanish under a very unlikely scenario; voters would have to show minimal growth perception and maximal deficit adjustment inertia, i.e. they would have to be able to foresee the recession 100%, but would believe that this has absolutely no effect on the deficit. If either condition is violated, the countercyclicality result holds. We would like to argue that voter beliefs are not fully responsive to economic forecasts, whereas the government is better able to make use of these forecasts. Although voters may be aware of the latest GDP growth forecasts released by international agencies such as the IMF, OECD, or European Commission, they are uncertain as to how those forecasts will affect their lives and public finances.

This is particularly relevant when thinking in terms of Portuguese municipalities. Since

[2] Henceforth, we use the word recession in a loose, non-technical sense. In the theoretical model, it means negative growth (relative to trend output). In the empirical part, we use several specifications for the "recession" variable including negative growth (relative to the previous year).

[3] Interestingly, this result cannot be obtained for country level data. Bohn and Sturm (2016) study various country samples of more than 100 countries as well as subdivisions of, for instance, developing countries, transition countries, or new democracies.

there are no regional or municipal growth forecasts, voters will find it hard to figure out how their local economy will perform and how municipal budget deficits will be affected. Given this uncertainty, we assume some inertia in voters' expectations. This assumption is also supported by Figure 1, which shows the evolution of the Portuguese Consumer Confidence Index (produced by the National Statistics Office - INE) and of the IMF's real GDP growth forecasts for Portugal for the following year (taken from the October issues of the World Economic Outlook), from 1998 to 2015.

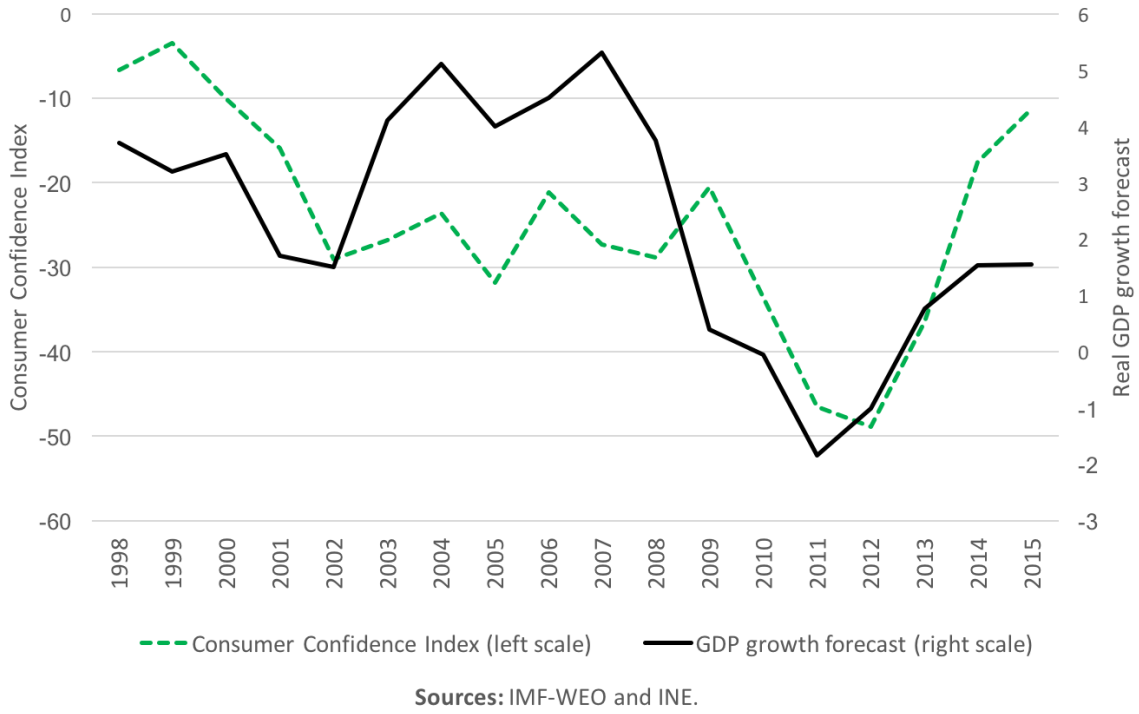

FIGURE 1: CONSUMER CONFIDENCE AND REAL GDP FORECASTS

It can be observed that consumer confidence lagged behind growth forecasts during the downturns of 1998 and 2008, and the upturn of 2012. Although both the forecast and consumer confidence went up in 2003, the increase in consumer confidence appears to be more modest. Since the scales are different, it is not easy to compare the volatility of the series just by looking at Figure 1. Therefore, we calculated the coefficient of variation (standard deviation divided by the mean) of each series, which is 0.52 for the Consumer Confidence Index, and 0.89 for the GDP growth forecasts. Thus, consistent with our

assumption of inertia in voters' expectations, consumer confidence is more stable than GDP growth forecasts.

The paper is structured as follows. Sections 2 and 3 lay out the analytical model. Section 4 presents the propositions and discusses the results. Sections 5 describes the data and the empirical model, while Section 6 presents and discusses the empirical findings. Section 7 concludes.

2 Model

The economy consists of n consumer-voters and two consumer-politicians who could be the running mayor and her challenger in Portuguese municipalities. Voters' utility depends on discounted period utility which, in turn, consists of additively-separable economic utility from a function in consumption c (with the standard concavity properties) and local public goods L as well as a political utility component (with weight α). θ could be interpreted as the voter's personal sympathy or ideological preference and is uniformly distributed over the interval [-1,1]; z takes the values $-\frac{1}{2}$, if government a (say left wing) is in power, or $\frac{1}{2}$, if government b (say right wing) is in power. A voter experiences a positive utility if her favourite party is in power; political utility is smaller for more centrist voters. As we can see later on, voters base their voting decision on prospective utility; more centrist voters may, therefore, be swayed to vote for the other party, if they expect a higher economic utility from it. Here is the voters' utility function:

$$U_t^i = \sum_{s=t}^{\infty} (\beta^i)^{s-t} E_s[u(c_s) + L_t + \alpha\theta^i z_s], \qquad i = 1, ..., n. \tag{1}$$

There are only two parties (or possible coalitions) which are represented by an incumbent (say, from party a, without limiting the generality of the analysis) and a challenger b who run for office every alternate period. Their utility consists of economic utility (analogous

to the voter's utility) and an ego rent, if they are in office. Hence politicians are purely opportunistic:

$$V_t^j = \sum_{s=t}^{\infty} W_s^j = \sum_{s=t}^{\infty} (\beta^j)^{s-t} E_s[u(c_s) + L_t + \mathbf{I}_s X_s], \qquad j = a, b; \tag{2}$$

$$\mathbf{I}_r = \begin{cases} 1 & \text{if in power in period } r; \\ 0 & \text{otherwise.} \end{cases}$$

Everybody's expected consumption depends on after-tax income which deviates from trend output $\bar{y}$ subject to a period specific growth shock ϵ_t. With $\bar{y}$ normalised to 1, trend output is given by $\epsilon_t = \bar{\epsilon} = 1$. $\bar{\epsilon}$ also depicts the previous period output and values below 1 capture a recession, those above 1 a boom. The tax rate is assumed to remain unchanged in an election period.[4]

$$E_t^k[c_t] \;=\; E_t^k[(1-\tau)\epsilon_t \bar{y}] \;=\; E_t^k[(1-\tau)\epsilon_t], \qquad k = j, i. \tag{3}$$

The provision of local public goods is obtained from the government budget constraint. The government receives revenues depending on growth shock ϵ_t and chooses the deficit level D_t which is the only government instrument. The government has to repay previous period deficit D_{t-1} at interest rate r_{t-1} which is exogenous though not necessarily constant; it is known by everybody and does not change with the volume of the deficit (reflecting the situation of Portuguese municipalities that are not allowed to incur large debts). In addition, the magnitude of L is affected by government competence η_t^j.

$$L_t = \tau\epsilon_t + D_t - (1 + r_{t-1})D_{t-1} + \eta_t^j. \tag{4}$$

[4] Increasing taxes in an election period is extremely unpopular. Increasing the provision of local public goods is more effective than decreasing taxes. In addition, territorial subdivisions like Portuguese municipalities often have limited influence on total tax revenue. Ignoring tax rate increases could also be justified by making a formal argument as in Shi and Svensson (2006). They obtain the optimal tax rate for the "equilibrium without elections" and then use backward induction in the 2-period election cycle to argue that the very same tax rate remains optimal.

Today's competence η_t is made up of i.i.d. shocks for this period as well as last period. It captures the government's efficiency which is not known by the government prior to the local public goods provision. Shocks μ_t^j are modelled as random variables with mean 0, distribution function $F(\mu_t^j) = F(\bullet)$ and density function $f(\mu_t^j) = f(\bullet) = F'(\bullet)$ which is (weakly) monotonously increasing up to the mean.[5] Here is the MA(1) process for government competence:

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j. \tag{5}$$

The timing of events is presented in Table 1. At the beginning of election period t, voters and incumbent a observe the realisations of last period's skills shock μ_{t-1}^a and deficit D_{t-1}. In period t, the incumbent also observes the (estimate for the) growth shock ϵ_t which allows her to choose her optimal level for the deficit D_t, thereby providing quantity L_t of local public goods. Voters observe L_t, but have to form (distorted) expectations about the growth shock, $\widehat{\epsilon_t}$, and the incumbent's optimal level for the deficit, $\widehat{D_t}$ because they exhibit belief inertia (which is discussed further down; see equations 13 and 14). On this basis, they determine their expectations of skills shock, $\widehat{\mu_t^a}$, which would influence the provision of local public goods in $(t+1)$, if the incumbent were re-elected. Voters are prospective in that they base their voting decision in period t on a comparison of utilities to be expected from the incumbent and challenger in period $(t+1)$. Note that voters can make a mistake in their expectation of the incumbent's competence in $(t+1)$ because of two forms of inertia: (i) they do not fully anticipate the deficit policy by the incumbent; and (ii) they do not fully anticipate an economic slump or boom.

In period $(t+1)$, the winner of the election receives ego rent X. Policy in $(t+1)$ is no longer dependent on voting though; hence either policymaker will repay the costly deficit

[5] For more unusual density functions (for instance, with $F''(\mu_t^a) < 0$ for some $\mu_t^a \leq 0$), we could get ambiguous results. However, the limiting case of $F''(\mu_t^a) = 0$ for some $\mu_t^a \leq 0$ or even over the entire range (uniform distribution) is acceptable.

and cut the provision of local public goods. Voters anticipate this, but cannot prevent it. Note also that the voting decision in election period t does not encompass concerns for expected utility in $t+2$ because the MA(1) nature of the competence process makes incumbent and challenger indistinguishable then. Policymakers do also not include $t+2$ in their decision problem for choosing the optimal level of D_t because they cannot affect their own utility or re-election chances in $t+2$. Hence the model can be split into 2-period cycles, each consisting of an election period (period t) and an off-election period (period $t+1$).

TABLE 1: The Timing of Events

Voters and incumbent *a* observe: - last period's deficit D_{t-i} - the incumbent's last period skills μ^{α}_{t-1} **Incumbent *a*:** - observes growth (estimate) ϵ_t - chooses deficit D_t - and provides local public goods L_t.	**Voters:** - observe local public goods L_t - form expectations of the incumbent's current period skills $\widehat{\mu^{\alpha}_t}$ (because they are inert-rational and have beliefs on expected growth $\widehat{\epsilon_t}$ and expected deficit $\widehat{D_t}$) - and vote.	The winner of the period t elections takes office and receives an ego rent. The winner repays the deficit of the previous period.
Period *t*		**Period *t+1***

3 Model Solution

The model is solved by maximising the incumbent a's expected utility in t and $(t+1)$ which depends, for $(t+1)$, on the incumbent's chance of winning the election which, in turn, depends on all individuals' probability of voting for incumbent a. The logic of the solution is explained here and details are provided in the appendix. Voters are prospective in that they vote for the politician who they expect to deliver a higher utility

for them after the elections.[6] Any voter i expects average skills from the challenger ($\eta^b_{t+1} = 0$), but has some idea about the incumbent's skills ($\eta^a_{t+1} = \mu^a_t + \mu^a_{t+1}$) because the incumbent's fiscal policy choice in period t influences voter i's expectations of the incumbent's current period skills shock $E^i_t[\mu^a_t]$. In Appendix A it is derived (and that is, in our view, close to reality) that a voter will vote for the incumbent, *either* if ideologies coincide and the challenger is not likely to do a better job ($E^i_t[\mu^a_t] \geq E^i_t[\mu^b_t] = 0$) *or* if the voter's (positive) perception of government competence makes up for the "wrong" ideological orientation of the incumbent:

$$E^i_t[\mu^a_t] \quad > \quad \alpha\theta^i. \tag{6}$$

The incumbents' probability of winning can then be obtained as:

$$\text{Prob} \left\{ [\frac{E^i_t[\mu^a_t]}{2\alpha} + \frac{1}{2}] \geq \frac{1}{2} \right\}. \tag{7}$$

The competence extraction mechanism, i.e. how a voter obtains $E^i_t[\mu^a_t]$, is shown in Appendix B. The basis is the government's budget constraint (4), here solved for μ^a_t:

$$\mu^a_t = L_t - \tau\epsilon_t - D_t + (1 + r_{t-1})D_{t-1} - \mu^a_{t-1}. \tag{8}$$

Knowing the provision of local public goods, output growth and the government's deficit decision (plus the tax rate, debt repayment, and previous period skills) true competence could be inferred. Voters can observe the provision of public goods, but do not know output growth and the government's deficit choice. Their perception of government

[6] Prospective voting should not be confused with rational expectations. In this paper, expected competence is influenced by voters' subjective beliefs, i.e. not based on rational expectations. Prospective voters only use their expectations of competence for evaluating the future consequence of their votes; there is no additional information about candidates because they are purely opportunistic.

competence $\widehat{\mu_t^a}$ is, therefore:

$$\begin{aligned} E_t[\mu_t^a] = \widehat{\mu_t^a} &= L_t - \tau\widehat{\epsilon}_t - \widehat{D}_t + (1+r_{t-1})D_{t-1} - \mu_{t-1}^a \\ &= \underbrace{L_t - \tau\epsilon_t - D_t + (1+r_{t-1})D_{t-1} - \mu_{t-1}^a}_{\mu_t^a \text{ from (8)}} + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]; \\ E_t[\mu_t^a] = \widehat{\mu_t^a} &= \mu_t^a + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]. \end{aligned} \tag{9}$$

Note that voters credit the government with above average competence ($\widehat{\mu_t^a} > 0$), if the government can increase the deficit by more than what is expected by voters ($D_t - \widehat{D}_t > 0$). This is the standard manipulation argument. However, if they underestimate a recession ($\epsilon_t < \widehat{\epsilon}_t < 0$), they believe in lower competence. We can now rewrite the incumbents' probability of winning:

$$\text{Prob}^{win} = \text{Prob}\left\{ [\frac{\mu_t^a + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]}{2\alpha} + \frac{1}{2}] \geq \frac{1}{2} \right\} \tag{10}$$

$$= \text{Prob}\left\{ \mu_t^a \quad \geq \quad [\tau(\widehat{\epsilon}_t - \epsilon_t)] + [\widehat{D_t} - D_t] \right\} \tag{11}$$

$$= 1 \quad - \quad F\,[\tau(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D_t} - D_t]. \tag{12}$$

If voters were modelled to have rational expectations, the probability of winning could not be affected by government manipulations in equilibrium, a result that is contradicted by evidence presented by, for instance, Aidt, Veiga and Veiga (2011), Akhmedov and Zhuravskaya (2004), and de Haan and Klomp (2013b). Proposition 1 confirms this finding. This is, however, only possible, if the right hand side in the brace of equation (11) (i.e. the argument of the F function in equation 12) becomes smaller than zero. This happens if we incorporate in the model an important behavioural trait that we find in the real world; voters exhibit belief inertia, but are otherwise quite sensible.

Such inert-rational voters could be described as follows:

$$E_t^i[\epsilon_t] \;=\; \widehat{\epsilon}_t = \phi\bar{\epsilon} + (1-\phi)\epsilon_t, \qquad 0 \leq \phi \leq 1, \quad \text{for all i.} \tag{13}$$

$$E_t^i[D_t] \;=\; \widehat{D_t} = \bar{D} + \gamma\tau(\bar{\epsilon} - \widehat{\epsilon}_t), \quad 0 \leq \gamma \leq 1, \quad \text{for all i.} \tag{14}$$

Parameter ϕ captures voter *growth perception inertia*, i.e. to what degree voters foresee actual growth relative to growth of the previous period. $\bar{D}$ depicts some kind of average of deficits in previous periods and is part of the deficit inertia. The overall expected government deficit is then adjusted by the expected revenue shortfall. Parameter $\gamma < 1$ depicts the *deficit adjustment inertia*. For $\gamma < 1$, this adjustment is incomplete, i.e. there is additional belief inertia in the voter's expected deficit. Note that, in contrast, the government chooses the deficit and does not suffer from belief inertia about growth.[7]

Inserting equations (13) and (14) into (12) (see Appendix B) delivers

$$\text{Prob}^{win} \;=\; 1 \quad - \quad F\,[\tau \;\; ((1-\gamma)\phi + \gamma) \;\; (\bar{\epsilon} - \epsilon_t) \;\; + \;\; \bar{D} \;\; - \;\; D_t]. \tag{15}$$

Here, we can see why the manipulation can increase the winning probability. If growth remains unchanged ($\bar{\epsilon} = \epsilon_t$), it suffices for the government to choose $D_t > \bar{D}$ in order raise re-election chances. In case of a boom, this becomes easier; in case of a recession, more difficult.

Hence, the incumbent a's decision problem can be simplified as follows (see Appendix C for details; discount factor β can be ignored because it does not affect the qualitative

[7] Obviously, this is a simplification. The idea is that governments have access to growth forecasts which are used because they give them an unbiased prediction of actual growth (whereas voters are not fully aware of such forecasts or do not fully incorporate them in their planning). In the empirical model, we assume that the local government uses estimated regional growth forecasts (based on national forecasts obtained externally from the IMF). We can even show that deviations of forecasted and actual ex post growth rates do not significantly affect the government's choice of deficit (see the first set of results of Table E.3 in Appendix E).

properties of the model):

$$\begin{aligned} max_{D_t}\ V_t^a = &\ max_{D_t}\ \ V \ = \ max_{D_t}\ W_t^a \ + \ W_{t+1}^a \\ = &\ max_{D_t}\ \ u((1-\tau)\epsilon_t) + L_t + X \\ + &\ \ u((1-\tau)\epsilon_{t+1}) + L_{t+1} \ \ + \ \ \text{Prob}^{win}\ \ X. \end{aligned} \tag{16}$$

where

$$\begin{aligned} L_t &= \tau\epsilon_t + D_t - (1+r_{t-1})D_{t-1} + \eta_t^j; \\ L_{t+1} &= \tau\epsilon_{t+1} - (1+r_t)D_t + \eta_{t+1}^j. \end{aligned}$$

The first order condition (FOC) is:

$$\begin{aligned} & 1 \ - \ (1+r_t) \ + \ F'[\tau\ ((1-\gamma)\phi+\gamma)\ (\bar{\epsilon}-\epsilon_t) \ + \ \bar{D} \ - \ D_t^*]\ X \ = \ 0 \\ \Leftrightarrow \ & r_t \ = \ F'[\bullet]\ X. \end{aligned} \tag{17}$$

Since the second order condition for a maximum holds, the first order condition (FOC) fully characterises the optimal deficit choice D_t^* by the government. The FOC is straightforward: the marginal loss from a deficit, i.e. the interest rate, must equal the marginal gain, i.e. the marginal increase in the (winning) chance for obtaining the ego rent. In other words, the government benefits from raising the deficit because it can impress upon voters that it is more competent and, thereby, raise its re-election chances so that it is more likely to enjoy the perks from staying in office.

Having confirmed the existence of a budget cycle, our main interest turns to studying the effect of a perturbation of ϵ_t on D_t^*, i.e. the change in government manipulation, if a recession is looming in an election year. Note that ϵ_t is the actual recession which

is, however, expected by the government. Furthermore, we are interested in how the government's optimal deficit response to a recession is influenced by the voters' growth perception inertia ϕ and deficit adjustment inertia γ. Some additional straightforward results are reported in Appendix D.

4 Propositions and Discussion

Before looking at perturbation results, we can confirm that the political budget cycle also leads to increased winning chances:

Proposition 1. - *Re-election Chances.*
The incumbent's fiscal manipulations are effective; the incumbent's vote share can be increased.

Proof: Simple inspection of equations (12) and (15); see also discussion thereof below the aforementioned equations on pages 9 and 10.

The proposition is supported by empirical findings by, for instance, Akhmedov and Zhuravskaya (2004), Aidt, Veiga and Veiga (2011), and de Haan and Klomp (2013b) who argue that government manipulations do indeed positively affect re-election chances. In addition, Boylan (2008) and Aidt, Veiga and Veiga (2011) find evidence that government manipulations increase if the election is closely contested, what Boylan calls a "close election bias". The next proposition suggests yet another reason for the incumbent to increase the magnitude of her manipulations.

Proposition 2. - *Recession (or Boom) Expectations.*
Imminent recession expectations (lower ϵ_t in equation 16) increase the government's optimal deficit at the equilibrium, albeit underproportionally. (Analogously, boom expectations decrease optimal deficits, albeit, again, underproportionally.) Hence, there is

a countercyclical policy effect.

$$0 \ \geq \ \frac{dD_t^*}{d\epsilon_t} = -\tau((1-\gamma)\phi + \gamma) \ > \ -1.$$

Proof: Appendix D.

Proposition 2 states the core result of the paper. If the incumbent government perceives an economic downturn, it expects lower revenues and will adjust its expenditures in order to limit its expected (costly) deficit. So, the deficit will not go up one-for-one with the revenue shortfall. Hence the "> -1" in the proposition. However, the government will not cut expenditures (for local public goods) one-for-one either, unless voters equally adjust their expectations. Hence the "$0 \geq$" in the proposition. Here is the reason. With voter growth perception inertia ($\phi > 0$), a reduction in growth is perceived, but underestimated. As a consequence, voters will attribute cuts in expenditures, at least partially, to government incompetence rather than the dire economic conditions. As a consequence, the government cannot cut expenditures one-for-one, if it does not want to damage its re-election chances too much. Higher growth perception inertia (higher ϕ) implies more government manipulation.

Voters' deficit adjustment inertia ($\gamma < 1$) works in the opposite direction and partially offsets the growth perception inertia effect. If voters think that the recession only has a limited effect on the deficit (high deficit inertia, i.e. low γ), they underestimate the deficit. Hence they attribute a better provision of local public goods to competence (rather than an increase in the deficit), which raises the incumbent's re-election chances. As a consequence, the government tends to limit its deficit in order to contain repayment costs. Higher deficit adjustment inertia (lower γ) implies less government manipulation. This intuition is formalised in Corrolary 1.

Corollary 1. - *Voter Inertia.*

The countercyclical policy effect in Proposition 2 is increased when the voter growth

perception inertia goes up (ϕ up), but decreased when the voter deficit adjustment inertia goes up (γ down).

$$\text{(i)} \quad \frac{d\frac{dD_t^*}{d\epsilon_t}}{d\phi} = -\tau(1-\gamma) < 0; \tag{18}$$

$$\text{(ii)} \quad \frac{d\frac{dD_t^*}{d\epsilon_t}}{d\gamma} = -\tau(1-\phi) < 0. \tag{19}$$

Proof: This follows directly from Proposition 2.

The main countercyclicality[8] result would only vanish under a very unlikely scenario; voters would have to show minimal growth perception inertia ($\phi = 0$) and maximal deficit adjustment inertia ($\gamma = 0$), i.e. they would have to be able to foresee the recession 100%, but would believe that this has absolutely no effect on the deficit. If either condition is violated, the countercyclicality result holds.

5 Data, Institutional Setting, and Empirical Model

The implications of the theoretical model are tested using financial, economic and political data for the 308 Portuguese municipalities. Local finance data was obtained from the Portuguese Directorate General of Local Authorities (DGAL), information regarding local elections and mayors from the Ministry of Internal Affairs, and demographic and economic data from the National Statistics Institute (INE). Actual GDP data and GDP forecasts are not available at the municipal level (NUTS IV level); so we go to the second lowest level of disaggregation, the NUTS III level, whenever possible.[9]

[8] Note that countercyclicality refers to higher spending (for instance, on local public goods) during recessionary periods. It does not capture the Keynesian idea of stimulating the economy. If this were included in the model, the government's manipulation incentive would actually be augmented and the countercyclicality result would be even stronger.

[9] NUTS is the European Union nomenclature for territorial statistical units. Portugal is subdivided into three NUTS I regions (Mainland, Azores and Madeira), seven NUTS II regions, and 25 NUTS III regions. Each NUTS III region aggregates several municipalities, which correspond to the NUTS IV level.

Actual GDP data is available at the NUTS III level from 1991. Given that there are no GDP growth rate forecasts at neither the municipal nor the regional levels, we use the 1-year-ahead forecasts from the October issues of the IMF's World Economic Outlook (WEO), released shortly before the municipalities must approve their budgets for the following year. In order to obtain 1-year-ahead forecasts at the regional level, we estimate ARIMAX(1,0,1), i.e. ARMAX(1,1)[10], models for the NUTS III GDP growth rate forecasts, employing the IMF's national GDP growth forecast as an explanatory variable. These estimated regional GDP growth forecasts are used as a proxy for the mayors' growth expectations in their regions because they incorporate national GDP forecasts while accounting for regional economic conditions. The ARMAX(1,1) model estimated for each region's GDP growth forecast can be summarized as follows:

$$Forec_t = \alpha_0 + \alpha_1 Forec_{t-1} + \alpha_2 NatForec_t + \zeta_t + \alpha_3 \zeta_{t-1}, \tag{20}$$

where $Forec_t$ is the real GDP growth forecast for the region under analysis for year t, $NatForec_t$ is the national real GDP growth forecast for year t (obtained from the IMF's WEO), and ζ_t is a white noise error term.

Institutional Setting

The Portuguese municipalities were formally established by the 1976 Constitution, which followed the bloodless military coup of 25 April, 1974. Local election dates are fixed exogenously from the perspective of the municipalities and they take place in all of them at the same time. The first municipal elections were held in December 1976. Since then, there were elections every three years until 1985, and every four years thereafter (in December until 2001, and in October since then). Other elections were never held at the same time; although local elections sometimes occurred in the same year as national elections, they were always at least three months apart.

[10] Since regional growth rates were found to be stationary, there is no need to take first-differences of the series.

Municipalities are governed by the Town Council (Câmara Municipal), which holds the executive power, and by the Municipal Assembly, which holds the deliberative power and approves the municipal budgets and plans of activities. The members of both chambers are elected directly by citizens, who vote in closed party or independent lists of candidates. The top candidate of the list receiving most votes for the Town Council becomes the mayor, presides that chamber and plays a leading role in the executive, having substantial power and autonomy.

The municipal budget is drafted by the mayor's team, is analysed by the Town Council, and finally approved by the Municipal Assembly. A mayor will have a larger margin of maneuver regarding the budget when her party holds a majority of deputies in both the Town Council and the Municipal Assembly. As shown in the descriptive statistics (Table E.1 in Appendix E), this happens in 75% of the cases, implying that the approval of the municipal budget is generally easy. Thus, in practice, the mayor plays a decisive role in local fiscal policy.

All Portuguese municipalities are subject to the same laws and regulations, and have the same responsibilities. Regarding public service provision, they are responsible for sewage, the distribution of water, local transportation and communication, basic schooling, property maintenance, promotion of culture and science, recreation and sports facilities, local health care, social housing, environmental protection, and municipal policing. Municipalities are financially autonomous in the sense of being able to elaborate and approve their own budgets without needing approval from a higher-ranked authority. But, for the large majority of municipalities, most revenues come from grants from the central government or from the European Union. In fact, own revenues account, on average, for just one third of total effective revenues (excluding loans), while formula-related (unconditional) grants from the central government account for roughly 40 percent, and other transfers from the central government or from the European Union account for the remaining 27 percent.

Municipalities are allowed to run deficits, but the law which regulates municipal finances imposes limits to deficits and to the stock of gross debt. A municipality whose debt is above the legal limit is obliged to reduce the excess debt by 10 percent each year. Excessive debt accumulation is typically not a problem for municipalities; currently only 20 out of the 308 have to submit to a formal debt reduction regime.

Empirical Model

According to our theoretical model presented above (Proposition 2), expected recessions in election years create incentives to generate higher budget deficits. That is, in an election year, mayors will be unwilling to counter the negative effects of a recession on the budget balance by sufficiently raising revenues (through higher local taxes and fees) or cutting expenditures (lowering the level of local public goods provision), which results in higher deficits. This does not necessarily happen in off-election years, when mayors can behave in a more responsible (less opportunistic) manner. These implications are tested with the following empirical model:

$$D_{i,t} = \beta_1 ElY_{i,t} + \beta_2 Recess_{i,t} + \beta_3 (ElY * Recess)_{i,t} + \mathbf{X}'_{i,t}\omega + \nu_i + \sigma_t + \xi_{i,t}, \qquad (21)$$

where $D_{i,t}$ is the budget deficit of municipality i in year t in real euros (of 2015) per capita; $ElY_{i,t}$ is a dummy variable that equals one in municipal election years, and zero otherwise; $Recess_{i,t}$ is our expected recession variable, based on the forecast of GDP growth for year t in the region to which municipality i belongs; $\mathbf{X}_{i,t}$ is a vector of control variables which may affect budget balances; ν_i represents unobserved municipality-specific effects; σ_t represents time-specific effects; and $\xi_{i,t}$ is the error term.[11]

Our expected recession variable, $Recess_{i,t}$, based on the estimated forecasts of the regional real GDP growth rate obtained in the ARMAX models of equation (20), is defined

[11] Since the election-year dummy would be collinear with yearly dummy variables, we control for time effects using a cubic time trend. In robustness tests, we also use 4-year mandate dummies and 5-year period dummies.

in four alternative ways: (1) the forecast itself, $Forec_{i,t}$, with negative values corresponding to expected recessions; (2) a recession dummy variable which takes the value of one when a negative growth rate is forecasted, and equals zero otherwise; (3) two dummy variables for unusually low growth, which equal one when the forecasted rate of real GDP growth is below the 25th or 33rd percentiles, respectively, of the past values of regional real GDP growth. $Recess_{i,t}$ is interacted with $ElY_{i,t}$, so that we can check if the effects of expected recessions in election years are different from those in the other years of the electoral cycle.

Given the theoretical model and the evidence of PBCs in Portuguese municipalities shown in previous studies (e.g., Aidt, Veiga and Veiga 2011, Veiga and Veiga 2007), we expect a positive β_1, consistent with higher deficits in election years. Furthermore, an expected recession for an election year leads to a higher deficit according to our theoretical model. Therefore, a negative β_3 is expected when our expected recession variable is the forecasted growth rate (expected lower growth rates lead to higher deficits), and a positive β_3 is expected when $Recess_{i,t}$ corresponds to the dummies for negative growth or for unusually low growth rates (expected recessions lead to higher deficits). The overall election-year effect on the budget balance is given by $(\beta_1 + \beta_3)$.

The vector $\mathbf{X}_{i,t}$ includes a set of control variables which may affect budget balances. These are related to demographics (shares of younger and older people, and population density), the structure of municipal expenditures and revenues (shares of investment expenditures and of own revenues), the ideological orientation and the experience (years in office) of the mayor, and whether or not the mayor's party holds a majority in both the Town Council and the Municipal Assembly. Descriptive statistics of the variables used in this paper are presented in Appendix E (Table E.1).

6 Empirical Results

The baseline empirical model of equation (21) is estimated for a panel of 308 Portuguese municipalities, with data from 1992 to 2014, using the fixed effects (within) estimator, with standard errors clustered by municipality. The results for the entire sample are reported in Table 2. Each column shows the results obtained for each of the four definitions of the $Recess_{i,t}$ variable.

The election year dummy variable is always statistically significant with a positive sign, indicating that there is a tendency for higher deficits in election years which can be specified in terms of real euros per capita (base year 2015). Concretely, the budget deficit increases by between 27.8 and 39.4 euros per capita in election years relative to off-election years. These results confirm those of Aidt, Veiga and Veiga (2011) and Veiga and Veiga (2007) regarding the existence of PBCs in Portuguese municipalities. The interaction of the forecast variable with the election year dummy has always the expected sign, but is only statistically significant in columns 1 and 2, that is, when we use the forecast itself or a recession dummy. As expected, and in accordance with the theoretical model, an expected recession leads to an even higher deficit in an election year.

The results obtained when using our expected recession dummy (column 2), for instance, indicate that a recession in an election year increases the deficit by an additional amount of 24.3 euros per capita. Thus, the overall increase in the deficit in an election year is 52.6 (=28.3+24.3) euros per capita when there is a recession at the same time. The effect of a recession in an off-election year is negative; looking at column 2 again, the deficit is reduced by 18.5 euros per capita, which means that the municipality implements a more conservative fiscal policy. However, the overall effect of a recession in an election year is positive (5.8 = – 18.5 + 24.3 euros per capita).

Regarding the control variables, there is weak evidence that a greater share of population

TABLE 2: Countercyclicality in PBCs

VARIABLES	(1) Growth Forecast	(2) Recession Dummy	(3) Forecast<25th perc. of GDP growth	(4) Forecast<33rd perc. of GDP growth
Election year	39.367***	28.335***	30.435***	27.836***
	(7.562)	(5.873)	(5.889)	(4.940)
Recession	4.060***	-18.532***	-11.051**	-11.630**
	(4.244)	(-3.219)	(-2.177)	(-2.583)
Election year * Recession	-3.877*	24.321**	10.261	13.125
	(-1.893)	(2.414)	(1.070)	(1.512)
%Population < 15	-3.394*	-3.768*	-3.853*	-3.743*
	(-1.696)	(-1.841)	(-1.901)	(-1.845)
%Population > 65	-2.947	-2.788	-2.998	-3.048
	(-1.428)	(-1.344)	(-1.447)	(-1.472)
Population density	0.046***	0.045***	0.045***	0.045***
	(4.537)	(4.134)	(4.322)	(4.361)
Investment Expend. (%Total)	4.253***	4.255***	4.261***	4.264***
	(13.865)	(13.823)	(13.850)	(13.867)
Own Revenue (%Total)	0.824*	0.847*	0.880*	0.895*
	(1.660)	(1.708)	(1.750)	(1.799)
Mayor left	-17.544**	-17.886**	-17.844**	-17.771**
	(-2.474)	(-2.513)	(-2.503)	(-2.495)
Mayor independent	17.856	17.055	18.329	17.871
	(0.626)	(0.602)	(0.646)	(0.630)
Years mayor	-0.544	-0.540	-0.553	-0.571
	(-1.444)	(-1.411)	(-1.470)	(-1.528)
Majority	0.933	1.186	1.067	1.033
	(0.177)	(0.225)	(0.203)	(0.196)
Observations	7,022	7,022	7,022	7,022
R-squared	0.119	0.118	0.117	0.117
Number of municipalities	308	308	308	308

Notes: Fixed-effects regressions with standard errors clustered by municipality. Recession variable defined as indicated in the respective column title. Time effects controlled for with a cubic time trend. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

under 15 is associated with lower deficits, while the share of elderly citizens does not seem to have significant effects. Greater population density seems to lead to higher deficits,

eventually due to costs of congestion. Higher shares of investment expenditures are also associated with higher deficits. The reason may be that an accumulation of medium and long-term debt is only allowed for funding investment expenditures according to the local finance law. There is weak evidence that a higher share of own revenues is also related to higher deficits. This somewhat unexpected result may arise from a higher exposure of these municipalities' finances to the business cycle, implying that revenues are more variable than in municipalities that can rely more on (stable) government transfers. The results also indicate that left-wing mayors produce lower deficits than their right-wing counterparts.[12] Finally, mayors' time in office and holding a majority in both the Town Council and Municipal Assembly do not seem to affect budget balances.

Overall, the results of Table 2 provide some evidence for the implications of our theoretical model, as the interaction of the election year dummy with the expected recession variable is statistically significant in the first two estimations. Stronger results may not have been obtained because the bulk of revenues of many municipalities consists of grants from the central government. Formula-determined (unconditional) grants depend on the main tax revenues of the central government (personal and corporate income taxes, and VAT) in the previous year, not being affected by the current year's economic situation. Therefore, a recession is expected to have smaller effects on the finances of a municipality highly dependent on unconditional grants than on one that relies more on own revenues and conditional (project-related) grants. This implies that the results should be stronger if we exclude from the sample the municipalities that rely heavily on unconditional grants.

[12] Veiga and Veiga (2007) obtained a similar result. Although the purpose of the present paper is not to explain partisan differences in deficits, we checked whether smaller deficits by left-wing mayors could be caused by greater transfers from the central government (because there was a prevalence of left-wing national governments during the sample period). This does not seem to have happened, as average transfers for left and right-wing municipalities were very similar, with a slightly higher amount given to the latter. This applies to both election and off-election years. Party similarity between the mayor and the prime-minister does not seem to have mattered either.

Table 3 reports the results obtained when the sample is composed only of the municipalities whose revenues from formula-related (unconditional) grants account for less than 50% of total revenues. Again, there is evidence of PBCs, as the election year dummy is positive and statistically significant. Now, the interaction of the expected recession variable with the election year dummy is always statistically significant, with the expected sign. Thus, as predicted by the theoretical model, an expected recession (negative growth) or unusually low growth (below the 25th or 33rd percentiles of past growth rates) lead to higher deficits in elections years. The results for the control variables are very similar to those of Table 2; the share of own revenues in total revenues (excluding loans) is no longer statistically significant because municipalities with large grants from the central government were thrown out of the sample; one component of the dependency ratio (population under 15) is no longer significant whereas another one (senior population) now (weakly) is.

The robustness of the empirical results is checked by implementing several specification changes. First, the control variables of vector $\mathbf{X}_{i,t}$ were excluded. Second and third, time-specific effects were controlled for in two alternative ways: with mandate dummies (one for each 4-year term), and with 5-year period dummies. Forth, the 30 municipalities of the islands of Azores and Madeira were excluded, so that we worked with an, arguably, more homogeneous dataset of 278 mainland municipalities. As shown in Appendix E (Table E.2) the results regarding the election year dummy variable and its interaction with the expected recession variable remain qualitatively and robustly the same. That is, the results of the robustness tests are consistent with the existence of Political Budget Cycles and with our theoretical model's conclusion that an expected recession leads to even higher election-year deficits.

We do several additional empirical tests. We check if deviations of the forecasted growth rate from the actual one affect the local government's choice of deficits. As shown in Appendix E (first panel of Table E.3), it does not; the difference of the two is never

TABLE 3: Countercyclicality in PBCs (Grants<50% of Revenues)

VARIABLES	(1) Growth Forecast	(2) Recession Dummy	(3) Forecast<25th perc. of GDP growth	(4) Forecast<33rd perc. of GDP growth
Election year	35.330***	19.425***	19.900***	18.917***
	(6.225)	(4.740)	(4.581)	(3.924)
Recession	2.932***	-20.983***	-13.345***	-10.682***
	(3.480)	(-3.749)	(-2.825)	(-2.629)
Election year * Recession	-4.954**	35.866***	23.883**	13.734*
	(-2.135)	(3.549)	(2.442)	(2.339)
%Population < 15	1.680	1.331	1.406	1.519
	(0.994)	(0.764)	(0.828)	(0.901)
%Population > 65	-5.017*	-4.933*	-4.920*	-4.930*
	(-1.688)	(-1.663)	(-1.659)	(-1.658)
Population density	0.049***	0.049***	0.048***	0.048***
	(4.124)	(3.885)	(4.047)	(4.095)
Investment Expend. (%Total)	3.366***	3.355***	3.372***	3.381***
	(11.976)	(11.997)	(11.984)	(12.002)
Own Revenue (%Total)	-0.065	-0.102	-0.069	-0.022
	(-0.131)	(-0.210)	(-0.137)	(-0.044)
Mayor left	-18.361***	-18.066***	-18.240***	-18.510***
	(-2.648)	(-2.603)	(-2.598)	(-2.653)
Mayor independent	-17.720	-17.721	-16.934	-17.714
	(-0.687)	(-0.703)	(-0.655)	(-0.685)
Years mayor	-0.225	-0.210	-0.238	-0.249
	(-0.649)	(-0.598)	(-0.689)	(-0.724)
Majority	6.448	6.943	6.629	6.516
	(1.252)	(1.342)	(1.298)	(1.277)
Observations	5,009	5,009	5,009	5,009
R-squared	0.126	0.128	0.125	0.125
Number of municipalities	308	308	308	308

Notes: Fixed-effects regressions with standard errors clustered by municipality. Recession variable defined as indicated in the respective column title. Time effects controlled for with a cubic time trend. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

statistically significant. Furthermore, the theoretical model implies that greater deficits in election-year recessions must be caused by a shortfall of revenues if governments are

unwilling to increase taxes or reduce public goods provision in election years. The results for total revenues (excluding loans) and for planned revenues (from the initial municipal budget) are also consistent with the model; the coefficient of the interaction of the election year dummy with the expected recession variable always has the expected sign and is statistically significant in all but one estimation (see Apendix E, second and third panels of Table E.3); in election years, forecasted negative growth or growth rates clearly below normal have the expected negative effect on revenues. Finally, we also analysed the behaviour of municipal expenditures. The results shown in the last panel of Table E.3 are consistent with those of previous papers (e.g., Aidt, Veiga and Veiga 2011, and Veiga and Veiga 2007) that found evidence of PBCs in the expenditures of Portuguese municipalities, since the coefficient for the election year dummy is always positive and statistically significant. Additionally, expected negative or unusually low growth in election years leads to even greater increases in municipal expenditures. Therefore, the positive effects of recessions in election-year municipal deficits seems to be due to the combination of reductions in revenues and increases in expenditures.

7 Conclusion

Our theoretical model captures the impact of recessions (and booms) on the political budget cycle. Even in a recession, budget manipulations allow the incumbent to increase her re-election chances. This is, however, only possible if manipulations in recessions go beyond the manipulations an incumbent employs in ordinary times. Belief inertia is what produces these results. If voters lag behind politicians in the perception of a growth decline, they judge the reduction in the provision of public goods more harshly, i.e. attribute a lower level of competence to the incumbent, which reduces her re-election chances. There is a partially offsetting effect, if voters do not fully adjust their expectations of the necessary increase in deficit due to the recession. A lower perception of the

deficit amounts to a hidden effort by the government; the increased level of the public goods provision is attributed to government competence.

The empirical results obtained for a sample comprising all 308 Portuguese municipalities, from 1992 to 2014, provide evidence for the core finding of the theoretical model; fiscal manipulations increase in recessions and decrease in booms. This amounts to countercyclical policy, all for the wrong reason of opportunistic behaviour rather than Keynesian stabilisation policy. In particular, we find evidence in an array of regression specifications that deficits go up in election years far beyond normal manipulations when there is a recession or unusually low growth; in an election year, revenues are lower and expenditures are higher when there is a recession compared to other election years.

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Appendix and Indications for the Referees

The appendix presents indications for the model solution in Section 3 and for the derivation of the propositions in Section 4. It also presents additional analytical results, descriptive statistics and additional empirical results.

A Probability of an individual to vote for the incumbent

First, we consider an individual who votes prospectively, i.e. she would prefer the politician who can deliver the highest level of expected overall utility in $(t+1)$. It consists of utility from consumption, utility from the provision of local public goods, and utility from the ideological alignment with the politician. She votes for incumbent a, if

$$\underbrace{E_t[u(c^a_{t+1}) + L^a_{t+1} + \alpha\theta^i(-\frac{1}{2})]}_{\text{exp. utility when } a \text{ in power}} \quad > \quad \underbrace{E_t[u(c^b_{t+1}) + L^b_{t+1} + \alpha\theta^i(+\frac{1}{2})]}_{\text{exp. utility when } b \text{ in power}}. \tag{A.1}$$

Obviously, voters differ in their preference for party a and b. Expected consumption is identical for both politicians, whereas the expected provision of local public goods is affected by the policymakers' competence and individuals' expectations thereof:

$$E^i_t[u(c^a_{t+1})] \;=\; E^i_t[u(c^b_{t+1})] \;=\; E^i_t[u((1-\tau)\epsilon_{t+1})]; \tag{A.2}$$

$$E^i_t[L^j_{t+1}] \;=\; E^i_t[\tau\epsilon_{t+1} - (1+r_t)D_t + \eta^j_{t+1}], \qquad j = a, b. \tag{A.3}$$

Equation (A.3) says that voters base their expectation of the provision of public goods in period $(t+1)$ on their belief of tax revenue in $(t+1)$. The period t deficit is repaid in period $(t+1)$ because it is costly. The policymaker will try not to borrow in period $(t+1)$ because there is no election at the end of that period and a non-balanced budget carries a repayment cost. Individuals have no idea about the skills shock of either potential policymaker in $t+1$. Nor do they know the skills shock of the challenger in period t, and, therefore, expect 0. However, they can use the incumbent's period t fiscal policy to draw conclusions about her skills shock in period t. The expected level of local public

goods of the challenger differs from what is know of the incumbent:

$$E_t[L^b_{t+1}] = E_t[\tau\epsilon_{t+1} - (1+r_t)D_t]; \tag{A.4}$$

$$E_t[L^a_{t+1}] = E_t[\tau\epsilon_{t+1} - (1+r_t)D_t] + E_t[\mu^a_t]. \tag{A.5}$$

Combining equations (A.1) to (A.5) we can obtain a condition for an individual to vote for incumbent a (which corresponds to condition (6) in the main text):

$$E_t[\mu^a_t] > \alpha\theta^i. \tag{A.6}$$

Using the distribution of the skills shock we can determine the probability (Pr) of any voter to vote for incumbent a:

$$Pr[E_t[\mu^a_t] - \alpha\theta^i \geq 0] = \frac{E_t[\mu^a_t] - (-\alpha)}{\alpha - (-\alpha)} = \frac{E_t[\mu^a_t]}{2\alpha} + \frac{1}{2}. \tag{A.7}$$

B Probability of the incumbent to win

Now, we can determine the probability $Prob$ that incumbent a obtains 50% of the votes in the period t elections. It is the probability that mass 1 of voters, i.e. all voters, times their individual probability Pr to vote for incumbent a (as determined in equation A.7) is greater or equal to $\frac{1}{2}$. The probability for the incumbent to win the election – equation (7) in the main text – is repeated here:

$$\text{Prob} \left\{ [\frac{E_t[\mu^a_t]}{2\alpha} + \frac{1}{2}] \geq \frac{1}{2} \right\} \tag{B.1}$$

Competence extraction mechanism: Voters' expectation of government competence μ^a_t can be obtained by studying the voters' perception of the government budget constraint (4) from the main text which is repeated here (with equation 5 inserted):

$$L_t = \tau\epsilon_t + D_t - (1+r_{t-1})D_{t-1} + \mu^a_t + \mu^a_{t-1}. \tag{B.2}$$

The true competence is:

$$\mu_t^a = L_t - \tau\epsilon_t - D_t + (1 + r_{t-1})D_{t-1} - \mu_{t-1}^a. \tag{B.3}$$

Voters can observe the level of local public goods L_t, previous period deficit D_{t-1}, previous period competence μ_{t-1}^a, interest rate r_{t-1} and the tax rate τ. Their perception of government competence is, however, also affected by their expectation of growth and the government deficit policy (which can be concealed, for instance, by using special government funds and accounting tricks). Hence we obtain what corresponds to equation (9) in the main text:

$$\begin{aligned} E_t[\mu_t^a] = \widehat{\mu_t^a} &= L_t - \tau\widehat{\epsilon}_t - \widehat{D}_t + (1 + r_{t-1})D_{t-1} - \mu_{t-1}^a \\ &= \underbrace{L_t - \tau\epsilon_t - D_t + (1 + r_{t-1})D_{t-1} - \mu_{t-1}^a}_{\mu_t^a \text{ from (8) or (B.3)}} + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]; \\ E_t[\mu_t^a] = \widehat{\mu_t^a} &= \mu_t^a + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]. \end{aligned} \tag{B.4}$$

Hence the incumbents' probability of winning becomes (equations 10 to 12 in the main text):

$$\begin{aligned} \text{Prob}^{win} &= \text{Prob}\left\{ [\frac{\mu_t^a + [\tau(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]}{2\alpha} + \frac{1}{2}] \geq \frac{1}{2} \right\} \\ &= \text{Prob}\left\{ \mu_t^a \quad \geq \quad [\tau(\widehat{\epsilon}_t - \epsilon_t)] + [\widehat{D_t} - D_t] \right\} \qquad \text{(B.5)} \\ &= 1 \quad - \quad F\,[\tau(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D_t} - D_t], \qquad \text{(B.6)} \end{aligned}$$

where $F(\bullet)$ is the distribution function of the skills shock.

The marked area towards the right (light grey or yellow [if in colour]) under the density function depicted in Figure B.1 corresponds to the probability described by equation (B.5) and by the distribution function representation in equation (B.6). Expected competence overall is greater than actual competence, if, in case of a recession, the government's deficit makes up for the voters' underestimation of the shortfall in tax revenue ($\tau(\widehat{\epsilon}_t - \epsilon_t) < 0$), plus the voters' expected deficit $\widehat{D_t}$ (deficit bias). Then the probability

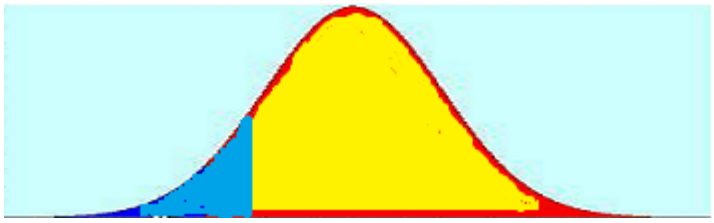

FIGURE B.1: BELL-SHAPED COMPETENCE DENSITY FUNCTION AS AN EXAMPLE

(see equation (B.6) or the light grey [or yellow] area under the density function) is always greater than $\frac{1}{2}$ and the government's chance to be re-elected is increased. The competence perception of voters would also be increased, if voters fully knew of and believed in the forecasted recession or did not have a deficit bias.

Inert-rational voters are described in equations (13) and (14) in the main text which are reproduced here:

$$E_t^i[\epsilon_t] \;=\; \widehat{\epsilon}_t = \phi\bar{\epsilon} + (1-\phi)\epsilon_t, \qquad 0 \leq \phi \leq 1, \quad \text{for all i.} \tag{B.7}$$

$$E_t^i[D_t] \;=\; \widehat{D_t} = \bar{D} + \gamma\tau(\bar{\epsilon} - \widehat{\epsilon}_t), \quad 0 \leq \gamma \leq 1, \quad \text{for all i.} \tag{B.8}$$

On this basis, we can derive equation (15) in the main text:

$$\begin{aligned}
\text{Prob}^{win} &= 1 - F\left[\tau\ (\widehat{\epsilon}_t - \epsilon_t)\right] + [\bar{D} + \gamma\tau(\bar{\epsilon} - \widehat{\epsilon}_t) - D_t], \\
&= 1 - F\left[\tau\ ((1-\gamma)\widehat{\epsilon}_t + \gamma\bar{\epsilon} - \epsilon_t) + \bar{D} - D_t\right], \\
&= 1 - F\left[\tau\ ((1-\gamma)\left(\phi\bar{\epsilon} + (1-\phi)\epsilon_t\right) + \gamma\bar{\epsilon} - \epsilon_t) + \bar{D} - D_t\right], \\
&= 1 - F\left[\tau\ ((1-\gamma)\phi + \gamma)\ (\bar{\epsilon} - \epsilon_t) + \bar{D} - D_t\right].
\end{aligned} \tag{B.9}$$

C The incumbent's maximisation problem

Prior to elections, incumbent a would like to maximise her utility over periods t and $(t+1)$ by choosing D_t (see the timing of events on page 6). Period $(t+1)$ utility is the sum of the utilities for winning and losing the election weighted by the probability determined previously. Hence, incumbent a's decision problem:

$$\begin{aligned} max_{D_t}\ V_t^a = \ & max_{D_t}\ \ V \ = \ max_{D_t}\ W_t^a \ + \ W_{t+1}^a \\ = \ & max_{D_t}\ \ E_t^a \ \{ \ u((1-\tau)\epsilon_t) + L_t + X \ \} \\ & + \quad E_t^a \ \{ \ \text{Prob}^{win} \ [u((1-\tau)\epsilon_{t+1}) + L_{t+1} + X] \ \} \\ & + \quad E_t^a \ \{ \ (1 - \text{Prob}^{win}) \ [u((1-\tau)\epsilon_{t+1}) + L_{t+1}] \ \} \qquad \text{(C.1)} \\ = \ & max_{D_t}\ \ u((1-\tau)\epsilon_t) + L_t + X \\ & + \quad u((1-\tau)\epsilon_{t+1}) + L_{t+1} \quad + \quad \text{Prob}^{win} \ X. \qquad \text{(C.2)} \end{aligned}$$

where

$$\begin{aligned} L_t \ &= \ \tau\epsilon_t + D_t - (1+r_{t-1})D_{t-1} + \eta_t^j; \\ L_{t+1} \ &= \ \tau\epsilon_{t+1} - (1+r_t)D_t + \eta_{t+1}^j \end{aligned}$$

The first order condition (FOC) is:

$$\begin{aligned} & 1 \ - \ (1+r_t) \ + \ F'[\tau \ ((1-\gamma)\phi + \gamma) \ (\bar{\epsilon} - \epsilon_t) \ + \ \bar{D} \ - \ D_t^*] \ X \ = \ 0; \\ \Leftrightarrow \ & r_t \ = \ F'[\bullet] \ X. \qquad \text{(C.3)} \end{aligned}$$

The second order condition for a well-behaved maximisation problem is satisfied because the manipulation pushes the critical value of the F function below mean 0 (see also Footnote 5). So the FOC determines the government's optimal deficit ${D_t}^*$.

D Perturbation results

The Implicit Function Theorem is used for obtaining perturbation results, both for Proposition 2 in Section 4 and for the straightforward results referred to at the end of Section 3.

Derivatives with respect to any variable x of the FOC around the optimal value ${D_t}^*$ will be denoted $\frac{\mathrm{d}\frac{\mathrm{d}V}{\mathrm{d}D_t}|_{D_t{}^*}}{\mathrm{d}x} =: V_{D_t x}$. The derivations of the marginal effect of changes in exogenous variables *on* the equilibrium value of the government's optimal choice of deficit ${D_t}^*$ are specified below.

For Proposition 2:

$$\frac{\mathrm{d}{D_t}^*}{\mathrm{d}\epsilon_t} = -\frac{V_{D_t\epsilon_t}}{V_{D_tD_t}} = -\frac{\tau\left((1-\gamma)\phi+\gamma\right)F''[\bullet]X}{F''[\bullet]X} = -\tau\left((1-\gamma)\phi+\gamma\right) \;>\; -1. \quad \text{(D.1)}$$

For the straightforward results referred to at the end of Section 3:

1. Government Cost Effect: Higher repayment costs r_t reduce the optimal government deficit at the equilibrium:

$$\text{(i)} \quad \frac{\mathrm{d}{D_t}^*}{\mathrm{d}r_t} = -\frac{V_{D_tr_t}}{V_{D_tD_t}} \;<\; 0. \quad \text{(D.2)}$$

2. Government Benefit Effect: A higher ego rent X increases the optimal government deficit at the equilibrium:

$$\text{(ii)} \quad \frac{\mathrm{d}{D_t}^*}{\mathrm{d}X} = -\frac{V_{D_tX}}{V_{D_tD_t}} \;>\; 0. \quad \text{(D.3)}$$

3. Leverage Effect: A higher tax rate τ decreases the optimal government deficit at the equilibrium if there is a boom, but increases it in case of a recession:

$$\text{(iii)} \quad \frac{\mathrm{d}{D_t}^*}{\mathrm{d}\tau} = -\frac{V_{D_t\tau}}{V_{D_tD_t}} \;<\; 0 \quad \text{if } \epsilon_t > 0; \quad \text{(D.4)}$$

$$\text{(iv)} \quad \frac{\mathrm{d}{D_t}^*}{\mathrm{d}\tau} = -\frac{V_{D_t\tau}}{V_{D_tD_t}} \;>\; 0 \quad \text{if } \epsilon_t < 0. \quad \text{(D.5)}$$

As for part 1, if the cost of manipulating the government deficit increases, the government will be more careful in expanding fiscal latitude in order to gain an electoral advantage.

The effect of increasing the social costs of deficits is captured in the different setting of the Shi and Svensson (2006) model, though not explicitly. As for part 2, the incumbent is willing to increase the manipulation, if there is a larger benefit from being re-elected. This implies that the government accepts additional costs of producing a deficit. Despite the model differences, such an effect of ego rents on manipulations is also confirmed by Shi and Svensson (2006). In part 3, as tax rate τ increases, the effect of an output shock is magnified. If there is a recession ($\epsilon_t < 0$), the government optimally increases the deficit in order to offset the loss in fiscal latitude; in case of a boom, the deficit is reduced. This leverage effect is not captured in either Shi and Svensson (2006) or Lohmann (1998).

E Descriptive Statistics and Additional Results

This subsection presents the descriptive statistics of the variables used in the empirical tests and some additional empirical results, including those of robustness checks.

TABLE E.1: Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Observations	Mean	St.Dev.	Min.	Max.
Deficit (real euros p.c.)	7,022	19.16	148.33	-1,301.34	3,955.61
Election year	7,022	0.26	0.44	0.00	1.00
Forecast (regional)	7,022	1.45	2.31	-7.97	9.65
Recession Dummy	7,022	0.23	0.42	0.00	1.00
Forecast<25th percentile	7,022	0.29	0.45	0.00	1.00
Forecast<33th percentile	7,022	0.36	0.48	0.00	1.00
%Population < 15	7,022	14.95	3.28	4.84	32.45
%Population > 65	7,022	20.72	6.38	7.12	44.97
Population density	7,022	285.91	815.26	4.41	7,865.82
Investment Expenditure (%Total)	7,022	33.51	15.43	-63.27	94.93
Own Revenue (%Total Effective Revenue)	7,022	33.12	18.95	1.14	124.75
Mayor left	7,022	0.52	0.50	0.00	1.00
Mayor independent	7,022	0.01	0.11	0.00	1.00
Years mayor	7,022	8.38	6.41	1.00	37.00
Majority	7,022	0.75	0.43	0.00	1.00
Formula grants (%Effective Revenue)	7,022	40.87	14.69	4.59	124.93
Number of municipalities	308	308	308	308	308

Sources: DGAL, Ministry of Internal Affairs, INE, and IMF.

TABLE E.2: Robustness Tests

VARIABLES	(1) Growth Forecast	(2) Recession Dummy	(3) Forecast<25th perc. of GDP growth	(4) Forecast<33rd perc. of GDP growth
Without the control variables of vector X				
Election year	42.696***	25.649***	26.507***	25.729***
	(7.188)	(6.280)	(6.167)	(5.350)
Election year * Recession	-5.135**	39.614***	25.379**	20.773**
	(-2.138)	(3.788)	(2.518)	(2.339)
Observations	5,015	5,015	5,015	5,015
R-squared	0.038	0.040	0.038	0.037
Controlling for time effects with 4-year mandate dummies				
Election year	41.871***	29.401***	30.214***	29.422***
	(7.084)	(6.157)	(6.109)	(5.477)
Election year * Recession	-3.699	28.680***	18.250*	15.772*
	(-1.630)	(2.835)	(1.966)	(1.909)
Observations	5,009	5,009	5,009	5,009
R-squared	0.129	0.131	0.129	0.129
Controlling for time effects with 5-year period dummies				
Election year	35.824***	20.792***	21.673***	21.203***
	(6.323)	(4.906)	(4.836)	(4.232)
Election year * Recession	-4.249*	37.385***	23.647**	18.709**
	(-1.855)	(3.792)	(2.473)	(2.214)
Observations	5,009	5,009	5,009	5,009
R-squared	0.128	0.131	0.129	0.128
Excluding 30 municipalities of Azores and Madeira				
Election year	37.983***	19.927***	20.351***	19.520***
	(6.430)	(4.707)	(4.551)	(3.954)
Election year * Recession	-6.786***	36.101***	23.983**	19.626**
	(-2.662)	(3.500)	(2.387)	(2.255)
Observations	4,557	4,557	4,557	4,557
R-squared	0.133	0.135	0.132	0.131

Notes: Fixed-effects regressions with standard errors clustered by municipality. Recession variable defined as indicated in the respective column title. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE E.3: Additional Results

VARIABLES	(1) Growth Forecast	(2) Recession Dummy	(3) Forecast<25th perc. of GDP growth	(4) Forecast<33rd perc. of GDP growth
Deficits (Including the difference between forecasted and actual growth rates)				
Election year	35.331***	20.195***	20.519***	20.538***
	(6.228)	(4.907)	(4.902)	(4.685)
Election_year*Recession	-4.604**	34.320***	27.511**	22.580**
	(-2.012)	(3.441)	(2.520)	(2.354)
GDP growth (forecast-actual)	-0.582	-0.415	-0.468	-0.532
	(-1.448)	(-1.026)	(-1.154)	(-1.311)
Observations	5,009	5,009	5,009	5,009
R-squared	0.126	0.128	0.127	0.126
Total Revenues (excluding loans)				
Election year	21.216***	38.696***	39.483***	32.396***
	(4.356)	(6.629)	(6.171)	(4.939)
Election_year*Recession	5.306**	-35.329***	-31.965***	-11.611
	(2.147)	(-3.392)	(-3.142)	(-1.242)
Observations	4,726	4,726	4,726	4,726
R-squared	0.546	0.541	0.541	0.542
Planned Revenues (from the initial budgets)				
Election year	25.627	77.360***	79.561***	76.442***
	(1.618)	(4.156)	(4.223)	(3.566)
Election_year*Recession	14.718**	-95.692***	-83.816***	-63.114**
	(2.422)	(-3.313)	(-3.225)	(-2.367)
Observations	2,644	2,644	2,644	2,644
R-squared	0.360	0.361	0.359	0.359
Total Expenditures				
Election year	49.952***	34.768***	36.112***	28.407***
	(5.597)	(6.516)	(6.204)	(4.573)
Election_year*Recession	-5.260*	34.589**	19.123***	29.853**
	(-1.735)	(2.458)	(1.385)	(2.431)
Observations	4,726	4,726	4,726	4,726
R-squared	0.558	0.555	0.554	0.555

Notes: Fixed-effects regressions with standard errors clustered by municipality. Recession variable defined as indicated in the respective column title. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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